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INVITED COMMENTARY

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The authors' manuscript reflects an area of growing interest in other specialties and should serve to stimulate research opportunities in vascular surgery. Articles relating to aspirin resistance have been published in the stroke and cardiology literature, where an increasing number of studies have shown an association between the incidence of adverse thrombotic events and aspirin resistance. The subject, however, has not been widely addressed in the vascular literature.

While important, the manuscript must be taken in context. As noted by the authors, aspirin resistance is not yet clearly defined, and can be characterized by laboratory measures or adverse clinical events. Laboratory measures of platelet function can include in vivo testing, such as bleeding time. Ex vivo tests include the measurement of arachidonic acid metabolites, such as urinary 11-dehydro TXB_2; measures of platelet-platelet interaction, such as optical or impedance aggregometry; point of care cartridge based analyzers, such as the PFA-100; and whole blood flow cytometry, which measures activation dependent changes on the platelet surface (such as CD62p, p-selectin; activated GPIIb/IIIa; leukocyte platelet aggregates), activation dependent signaling, and activation dependent release from platelets. Of concern, however, the reported incidence of aspirin resistance is variable, even using comparable techniques; resistance in studies employing aggregometry has ranged from 0.4% to 9%, and using the PFA-100 from 9% to 35%.[1]

Clinical studies have demonstrated a higher incidence of aspirin resistance among patients with a prior history of transient ischemic attack or stroke; high risk patients with a history of coronary artery disease have increased odds of being aspirin resistant.[2] Mueller et al.[3] followed 100 patients with intermittent claudication, treated with 100 mg of aspirin per day, for 18 months after balloon angioplasty. Only 40% of male patients showed the expected effect of aspirin using in vitro platelet aggregation. All reocclusions at the site of angioplasty occurred in this group. Higher vascular event rates have also been correlated with measures of aspirin resistance in several prospective studies. Aggregometry, urinary 11-dehydro TXB_2 levels, and the PFA-100 have been used to assess platelet function. Interestingly, results from the PFA-100 did not correlate with aggregometry and did not correlate with vascular events.[1]

The current study uses two techniques to assess laboratory evidence of aspirin resistance in patients on chronic aspirin therapy and illustrates the caution that must be exercised in interpreting results. Measurement of arachidonic acid induced expression of CD62p (P-selectin), using flow cytometry, demonstrates that all patients receiving aspirin show an aspirin effect, while PFA-100 closure times indicate 16% of patients taking aspirin show no effect of aspirin. The PFA-100 can be influenced by multiple variables, including platelet count, platelet function, red blood cells, and von Willebrand factor; and the outcome can be effected by variables, such as von Willebrand factor, that are not influenced by aspirin. None-the-less, the current study is a very nice introduction to the concept of aspirin resistance and provides an example of its application in vascular surgery. While the study demonstrates evidence of laboratory resistance, it has failed to exclude patient noncompliance as a source of "resistance" and has not correlated laboratory resistance with clinical evidence of adverse events. The study also demonstrates that laboratory measures can influence the extent and character of laboratory defined resistance. Future studies could randomize aspirin therapy and laboratory adjusted aspirin therapy, based on identified resistance; verification of compliance and documentation of clinical outcomes should be incorporated.

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